

REMARKS

Claims 1-49 and 58-76 are now pending in the above-referenced patent application. Applicants respectfully request further consideration of these claims, in view of the amendments set forth above and the following remarks.

Amendments to the Specification

The specification has been amended to correct a typographical error (paragraphs [0001], [0038] and [0145]) and to update the status of several co-owned co-pending patent applications (paragraphs [0038], [0049], [0119], [0120], [0121], [0126], [0131], [0132], [0137], [0146] and [0148]). No new matter has been added.

Cancelled Claims

Claims 50-57 have been cancelled in response to the restriction requirement, now made final in the Office action, to advance the prosecution of the instant case. Applicants expressly reserve the right to refile the cancelled claims, without prejudice, in a continuing application.

Amended Claim

Claim 1 has been amended to clarify what Applicants regard as their invention without narrowing the substantive scope thereof.¹ Support for the amendment can be found throughout the specification, including for example at paragraphs [0008] through [0010], especially for example in paragraph [0010] at page 4, lines 25-27. Claim 1 has also been amended as suggested by the Examiner, without change in the substantive scope thereof, to delete the word “such” in line ten thereof. No new matter has been added.

¹ The remarks in the Office action in this regard (*e.g.*, that “it appears that the four or more reaction channels are the four or more reactors”) are not entirely accurate. As consistently used in the specification in the context of a parallel flow reactor, reference to “reaction channels” relates to a path of fluid communication that includes the reactors, as well as associated inlets, outlets and at least portions of the distribution system. Nonetheless, Applicants have amended claim 1 without narrowing the scope thereof to advance the prosecution of the instant application.

Information Disclosure Statement

The Office action states that the information disclosure statement filed by Applicants on September 10, 2002 was deficient with respect to the Wijngaarden *et al.* reference. However, the Office action does not denote the particular reason as to why the reference was not considered. (*See* paragraph 2 at page 4 of the Office action).

Accordingly, Applicants are filing an Information Disclosure Statement on the date even herewith again listing the Wijngaarden *et al.* reference and providing a copy of the portion thereof that caused it to be listed. Further consideration of the pending claims is respectfully requested in view of this reference.

Drawings

The drawings have been objected to under 37 C.F.R. 1.83(a) with respect to showing flow restrictors in the form of “capillaries and microtiter plate or integral with one or more microchip bodies mounted on a substrate”. (*See* paragraph 3 at page 4 of the Office action).

Applicants have attached hereto a proposed draft Figure 4A-2 to show a flow restrictor in the form of capillaries 531a, 531b, 531c, 531d, 533a, 533b, 533c and 533d. (*See*, for example, claim 15). If the proposed draft Figure 4A-2 is acceptable to the Office, then Applicants will amend the specification to add Figure 4A-2, to renumber present figure Figure 4A as Figure 4A-1, and to appropriately amend the Brief Description of the Drawings and the Detailed Description of Preferred Embodiments.

Applicants respectfully request clarification of the Office’s objection as regards “microtiter plate”. The feature to which this portion of the objection refers is not clear from the statement of the objection in the Office Action.

Applicants respectfully traverse the objection with respect to flow restrictors characterized as being integral with a substrate or with one more microchip bodies mounted on a substrate (*See*, for example, claims 10-13) or characterized as microfluidic channels (*See*, for example, claim 14). The Office’s attention is drawn in this regard, for example, to: Figures 3A through 3I (especially Figures 3E, 3F, 3G and 3H, *e.g.*, showing flow restrictors 3516a, 3516b); Figures 4A through 4E (*e.g.*, showing flow restrictors 531a, *et seq.*, 533a, *et seq.* and 535a, *et seq.*); Figures 5A through 5C (*e.g.*, showing flow restrictors without reference numerals); Figures

11A through 11O (especially Figures 11D through 11F, *e.g.*, showing flow restrictors labeled with relative conductance values).

Claim Objections

Claim 1 has been objected to with respect to various informalities. (*See* paragraph 4 at pages 4-5 of the Office action).

This objection is obviated in view of the amendments to claim 1.

Rejection Under 35 U.S.C. § 112 (Indefiniteness)

Claim 15 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Office action states that “it is unclear what is meant by flow restrictors are capillaries. Are they just holes or capillary tubes?” (*See* paragraph 6 at page 5 of the Office action).

Applicants respectfully traverse this basis for rejection. The term “capillaries” has a well-defined and accepted meaning to persons of skill in the art. Applicants have not deviated from the ordinary meaning, as understood by a person of skill in the art.

Accordingly, this basis for rejection is without merit.

Rejections Under 35 U.S.C. § 102(b) or 103(a) (LaCount)

The Office action rejects claims 1-9, 27, 40-49, 58, 60-72, 75 and 76 under 35 U.S.C. § 102 (b) as being anticipated by, or in the alternative under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 5,204,270 to LaCount. (*See* paragraph 11 at pages 6-10 of the Office action).

Applicants respectfully traverse this basis for rejection.

Applicants disagree with the manner in which the Office is characterizing various features as disclosed in Figure 1 of the LaCount ‘270 patent.

In particular, for example, Applicants disagree with the characterization of features identified in Figure 1 of LaCount by reference numerals “9” and “7” as being “reactors” and “mixing zones” respectively. In fact, as described at Col.8, lines 28-29 thereof, reference

numeral 9 of Fig. 1 depicts one of two hot zones of a furnace – not a reactor, and reference numeral 7 of Fig. 1 depicts another of the two hot zones of the furnace – not a mixing zone.

Also, for example, the features identified in Figure 1 of LaCount by reference numerals “27”, “29”, “30” and “35” are mistakenly characterized as being “flow restrictors”. However, as expressly described at Col.8, lines 36-38, reference numerals 27 and 29 refer to supply tubes – not flow restrictors. Similarly, as described at Col. 8, lines 39-48, reference numerals 30 and 35 refer to mass flow controllers – not flow restrictors. (See, for example, paragraph [0049] at page 16, lines 21-23 of the specification, in which flow restrictors are distinguished from active flow control elements used to control flow, such as flow controllers).

As such, LaCount does not disclose the combination of structure required in independent claims 1, 58 and 60, including at least (as considered in combination with other features of claims 1, 58 and 60): a set of four or more first-feed-component flow restrictors, each of the four or more first-feed-component flow restrictors providing fluid communication between the first feed component source and one of the four or more mixing zones, each of the four or more first-feed-component flow restrictors having a flow resistance that varies relative to other first-feed-component flow restrictors in the set. For the same reasons, LaCount does not anticipate claims 2-9, 27, 40-49, 61-72, 75 and 76, each of which depend from claim 1, 58 or 60.

Further, the Office action does not set forth a *prima facie* case of obviousness with respect to claims 1, 58 and 68 (or claims depending therefrom). The LaCount reference does not disclose all of the required features of these claims. Moreover, there is no motivation existing in the art that would have led a person of ordinary skill to modify the embodiment disclosed in LaCount in a manner that would have led to Applicants’ inventions as defined by these claims.

Accordingly, Applicants respectfully request that this basis for rejection be withdrawn.

Rejections Under 35 U.S.C. § 102(b) or 103(a) (Parce *et al.*)

The Office action rejects claims 1, 9-15, 40, 41, 42, 44-46, 48, 49, 58-60, 67-71 and 73-76 under 35 U.S.C. § 102(b) as being anticipated by or under 35 U.S.C. § 103(a) as being obvious over WO 98/00231 to Parce *et al.*. (See paragraph 12 at pages 10-15 of the Office action).

Applicants respectfully traverse these rejections.

Applicants disagree with the Office's technical reading of this reference, and particularly, the manner in which the Office is characterizing various features as disclosed in Figure 3 and Figures 4A through 4F thereof.

In particular, for example, Applicants disagree with the characterization of features identified in Figure 3 and Figures 4A through 4F of Parce *et al.* by reference numeral "344" as being "reactors". In fact, as described at page 39, lines 3-5 thereof, reference numeral 344 depicts a particle retention zone – not a reactor.

Also, for example, the feature identified in Figure 3 and Figures 4A through 4F of Parce *et al.* by reference numeral "346" is inaccurately characterized as being a "flow restrictor". However, as expressly described at page 40, lines 14-16, reference numeral 346 refers to beads for immobilizing test compounds – not flow restrictors.

Applicants respectfully contend that, contrary to statements made in the Office action, the reference does not disclose a fluid distribution system for supplying a feed composition in varying relative amounts to a reaction cavity in the manner required by the presently pending claims. In particular, each of independent claims 1, 58 and 60 requires a feed composition subsystem that includes (in combination with other features of claims 1, 58 and 60): a set of four or more first-feed-component flow restrictors, each of the four or more first-feed-component flow restrictors providing fluid communication between the first feed component source and one of the four or more mixing zones, each of the four or more first-feed-component flow restrictors having a flow resistance that varies relative to other first-feed-component flow restrictors in the set. Although Parce *et al.* disclose the use of fluidic channels as flow restrictors in the context of Figure 3 (*See* page 39, lines 15-32) the disclosure is expressly directed to "promote equal flow in all parallel channels" (*See* page 39, line 21 and line 26). As such, there is no disclosure that feed component flow restrictors have a flow resistance that varies relative to other flow restrictors in a set of flow restrictors. Also, there is no disclosure of flow restrictors having varying relative flow resistance configured for use in a in the particular arrangement for controlling feed composition (*e.g.*, with a flow restrictor between a source and a mixing zone) as required in the presently-pending claims.

Accordingly, Parce *et al.* do not anticipate independent claims 1, 58 or 60. For the same reasons, Parce *et al.* do not anticipate claims 9-15, 40, 41, 42, 44-46, 48, 49, 59, 67-71 and 73-76, each of which depend from claim 1, 58 or 60.

Further, the Office action does not set forth a *prima facie* case of obviousness with respect to claims 1, 58 and 68 (or claims depending therefrom). As noted above, Parce *et al.* do not disclose all of the required features of these claims. Moreover, there is no motivation existing in the art that would have led a person of ordinary skill to modify the embodiment disclosed in Parce *et al.* in a manner that would have led to Applicants' inventions as defined by these claims.

Nonetheless, the Office action posits in this regard, that

(e)ach of the four or more flow restrictors *is capable of* having or providing a flow resistance that varies relative to other flow restrictors in the set to provide at least two feed components in varying relative amounts to the reaction cavity of each of the four or more reactors while maintaining substantially the same total flow through each of the four or more mixing zones.

See paragraph 12 at page 13 of the Office action (*emphasis added*). However, this appears to be completely unsupported conjecture by the Office; Parce *et al.* do not disclose, teach or suggest such capability nor any structure configured for achieving such capability. The law is clear that obviousness cannot be established based merely on the fact that the reference could have been combined or modified, unless the prior art also suggests the desirability of the combination. In re Mills, 16 USPQ2d 1430 (Fed. Cir. 1990).

The Office action also takes the position that

(o)ne would also expect that there would be natural imperfections in the flow restrictors and conduits connecting each flow restrictor with each reactor, such that each set of reactor and flow restrictor within a set of flow restrictors would have at least a slightly different flow resistance although they may be considered to have substantially the same flow resistance.

See paragraph 12, at page 13-14 of the Office action. However, (even ignoring the apparent internal inconsistency of this statement), Applicants fail to appreciate the significance of this statement. To the extent the Office is relying on inherency, such reliance is misplaced because the asserted conclusion does not *necessarily follow* from the teaching of Parce *et al.* Moreover, , inherency is not relevant in the context of obviousness. Courts have long held that inherency and obviousness are entirely different questions. "That which may be inherent is not necessarily known. Obviousness cannot be predicated on what is unknown." *In re Shetty*, 195 USPQ 753 (CCPA 1977) quoting *In re Spormann* 150 USPQ 449 (CCPA 1966). See also *In re Rijckaert* , 28 USPQ2d 1955 (Fed. Cir. 1993).

Finally, the Office action asserts that

(n)evertheless, it would have been obvious.... to provide each of the flow restrictors within a set with a flow resistance that varies relative to others within the set or the capability of providing a different flow resistance relative to others within respective sets *to allow flexibility in providing different amounts of components to each of the reactors to perform different reactions in each of the reactors as necessary or desired to achieve high throughput.*

See paragraph 12, at page 13-14 of the Office action (*emphasis added*). However, the asserted basis for motivation – to allow flexibility – is too general to motivate a skilled artisan to arrive at the specific invention defined by claims 1, 58 and 60. See *In re Fine*, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Dow Chemical Co.*, 5 USPQ2d 1529 (Fed. Cir. 1988); *In re Geiger*, 2 USPQ2d 1276 (Fed. Cir. 1987). The law requires a more specific suggestion. The need for specificity pervades the jurisprudence of obviousness. See for example: *In re Kotzab*, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000) ("particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed"); *In re Rouffet*, 149 F.3d 1350, 1359, 47 USPQ2d 1453, 1459 (Fed. Cir. 1998) ("even when the level of skill in the art is high, the Board must identify specifically the principle, known to one of ordinary skill, that suggests the claimed combination. The Federal Circuit recently reiterated the need for a specifically-directed motivation, rather than just lofty, generalizations in the context of treatment for heart arrhythmias:

Recognition of the problem of treating complex heart arrhythmias does not render obvious the eventual solution. Recognition of a need does not render obvious the achievement that meets that need. There is an important distinction between the general motivation to cure an uncured disease (for example, the disease of multiple forms of heart irregularity), and the motivation to create a particular cure.

Cardiac Pacemakers, Inc. et al. v. St. Jude Medical, Inc., et al., Nos. 02, -1532, -1539 (Fed. Cir. Aug. 31, 2004). In the present case, there was neither a recognition of a need, nor a suggestion that would have motivated a skilled person to create the particular solution being claimed by Applicants.

In view of the lack of motivation and other deficiencies noted above, the Office action appears to be improperly relying on hindsight – by using Applicants' specification to extrapolate the teachings of *Parce et al.* – without proper motivation for such extrapolation existing in the prior art. The Federal Circuit has repeatedly warned against such hindsight reconstruction (*i.e.*,

against finding the required motivation in the guidance of the instant specification), and held that such extrapolation is improper under the law. *See, for example, Grain Processing Corp. v. American Maize-Products Co.*, 5 USPQ2d 1788 (Fed. Cir. 1988) (stating that obviousness cannot be established by merely showing that each element of the patented products may be found somewhere in the prior art). *See also In re Vaeck*, 20 USPQ2d 1438 (Fed. Cir. 1991), and *In re Dembiczak*, 50 USPQ2d, 1614 (Fed. Cir. 1999). *See also In re Kotzab*, 54 USPQ2d 1308 (Fed. Cir. 2000) (holding that an invention was not obvious, even though based on technologically simple concepts from a combination of known elements, since there was an absence of a specifically-identified understanding within the knowledge of a skilled artisan that would have motivated one to make the particular claimed invention).

Accordingly, Applicants respectfully request that this basis for rejection be withdrawn.

Rejections Under 35 U.S.C. § 103(a) (Guan *et al.*)

The Office action rejects claims 1, 9, 14, 15, 40, 41-49, 58, 60, 67-71, 73, 75 and 76 under 35 U.S.C. § 103(a) over WO 99/67160 to Guan *et al.* *See* paragraph 13 at pages 15-18 of the Office action.

Applicants respectfully traverse this basis for rejection.

The Office action does not set forth a *prima facie* case of obviousness with respect to claims 1, 58 and 68 (or claims depending therefrom).

Guan *et al.* do not disclose all of the required features of independent claims 1, 58 and 60. Contrary to the unsupported assertions made in the Office action, Guan *et al.* do not disclose a fluid distribution system for supplying a feed composition in varying relative amounts to a reaction cavity in the manner required by the presently pending claims. In particular, each of independent claims 1, 58 and 60 requires a feed composition subsystem that includes (in combination with other features of claims 1, 58 and 60): a set of four or more first-feed-component flow restrictors, each of the four or more first-feed-component flow restrictors providing fluid communication between the first feed component source and one of the four or more mixing zones, each of the four or more first-feed-component flow restrictors having a flow resistance that varies relative to other first-feed-component flow restrictors in the set. As acknowledged in Applicants' instant specification (*See* paragraph [0004]), Guan *et al.* disclose the use of flow restrictors such as capillaries for controlling fluid flow to reactors of a multi-

channel parallel flow reactor. (*See*, for example, Figure 1 and related discussion at page 6, line 28 through page 7, line 20 of Guan *et al.*). However, the disclosure expressly and unambiguously teaches that the flow restrictors are configured to ensure that “the test fluid is apportioned about equally between each of the vessels.” (*See* for example, page 7, lines 15-20 of Guan *et al.*; *See* also, for example, Guan *et al.*: at page 6, lines 5-6; and at page 12, line 25 through page 13, line 21 (including especially at page 12, lines 26-30)).

As such, there is no disclosure in Guan *et al.* that feed component flow restrictors have a flow resistance that varies relative to other flow restrictors in a set of flow restrictors. Also, there is no disclosure of flow restrictors having varying relative flow resistance configured for use in a in the particular arrangement for controlling feed composition (*e.g.*, with a flow restrictor between a source and a mixing zone) as required in the presently-pending claims.

Moreover, there is no motivation existing in the art that would have led a person of ordinary skill to modify the embodiment disclosed in Guan *et al.* in a manner that would have led to Applicants’ inventions as defined by these claims. The Office action merely repeats the same line of reasoning as set forth in connection with the discussion of Parce *et al.* However, such reasoning is deficient in the context of Guan *et al.* – at least to the same extent as it was in the context of Parce *et al.* The Applicants comments in this regard, as delineated above with reference to Parce *et al.*, are equally relevant to and are hereby extended (by reference) to demonstrate non-obviousness over Guan *et al.*

Accordingly, independent claims 1, 58 and 60 are not obvious over Guan *et al.*. Claims depending therefrom (including claims 9, 14, 15, 40, 41-49, 67-71, 73, 75 and 76) are therefore also patentable over this reference.

Rejections Under 35 U.S.C. § 103(a) (LaCount in view of Cherukuri *et al.*)

The Office action rejects claims 16-39 under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 5,204,270 to LaCount in view of U.S. Patent No. 5,603,351 to Cherukuri *et al.*. *See* paragraph 14 at pages 18-19 of the Office action.

Applicants respectfully traverse these rejections.

The Office action does not set forth a *prima facie* case of obviousness.

Since each of claims 16-39 depend from claim 1, this basis for rejection is deficient at least for the reasons stated above responsive to the rejection of claim 1 as being anticipated /

obvious over LaCount. The Applicants comments in this regard, as delineated above with reference to LaCount, are equally relevant to and are hereby extended (by reference) to demonstrate non-obviousness over the combination of LaCount and Cherukuri *et al.* The Office action does not demonstrate how Cherukuri *et al.* make up for the deficiencies of LaCount. Moreover, there is no basis existing in the art, nor even asserted in the Office action, as to why a person of ordinary skill in the art would have been motivated to modify the teaching of LaCount and include particular selected features of Cherukuri *et al.* in a manner that would have arrived at Applicants invention.

Accordingly, claims 16-39 are not obvious over LaCount in view of Cherukuri *et al.*

Provisional Obviousness-Type Double Patenting Rejections

Claims 1-49 and 58-76 have been provisionally rejected under the judicially created doctrine of obviousness-type double patenting as allegedly being unpatentable over claims 1-190 of copending Application Serial No. 09/801,390. Applicants will consider submitting a terminal disclaimer to obviate the provisional rejection, if necessary.

Equivalents

The amendments to the claims and the arguments presented in response to the Office action have been made to claim subject matter which the Applicants regard as their invention. By such amendments, the Applicants in no way intend to surrender any range of equivalents beyond that which is needed to patentably distinguish the claimed invention as a whole over the prior art. Applicants expressly reserve patent coverage to all such equivalents that may fall in the range between applicants literal claim recitations and those combinations that would have been obvious in view of the prior art. In particular, as noted above, none of the claims have been narrowed within the meaning of *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 62 USPQ2d 1705 (2002), and Applicants are therefore entitled to the full range of equivalents with respect to each of the presently-pending claims.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

Applicants believe that no further fees are required in connection with the instant Amendment B. If necessary, however, the Examiner is hereby authorized to charge any fees required in connection with this application to Deposit Account No. 50-0496.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Paul A. Stone', with a large, stylized initial 'P'.

Date Submitted: Oct. 22, 2004

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Encl. – Proposed Draft Figure 4A-2